

## Claims

1. Electrically controlled optical add-drop multiplexer, having at least an optical waveguide, multiplexer, demultiplexer, optical filter, micro-electrical-mechanical system and optical amplifier, wherein the optical components and electrical components for controlling the add-drop multiplexer are arranged on a multilayer printed circuit board with electrical and optical conductor paths.
2. Add-drop multiplexer according to Claim 1, characterized in that at least one layer of the multilayer printed circuit board has both optical and electrical conductor paths.
3. Add-drop multiplexer according to Claim 1 or Claim 2, characterized in that the multilayer printed circuit board has organic and/or inorganic materials.
4. Add-drop multiplexer according to any one of the preceding claims, characterized in that the optical conductor paths are made of glass and/or polymers.
5. Add-drop multiplexer according to any one of the preceding claims, characterized in that the optical conductor paths are fashioned from glass, silicon oxide, silicon dioxide or polymer and possibly contain doping.

6. Add-drop multiplexer according to any one of the preceding claims,

characterized in that

5 the optical conductor paths have three-dimensional optical structures.

7. Add-drop multiplexer according to any one of the preceding claims,

10 characterized in that

the add-drop multiplexer also has at least one of the following means:

means for electro-optical conversion,

means for opto-electrical conversion,

15 means for electro-optical interference,

means for opto-electrical interference,

means for optical interference.

8. Add-drop multiplexer according to any one of the preceding claims,

20 characterized in that

the add-drop multiplexer also has at least one of the following means:

optical switch, laser diode, photodiode, arrayed waveguide

25 grating, branch/tap, optical modulator.